

ericksburg, Tex., 7th, powerfully electrified; 9th, greatly. Concho, Tex., 10th, 15th, 16th. Fort Mc Kavett, Tex., 16th, screws on lightning arrester fused. Pembina, wires considerably affected, 14th, 15th, 18th; wires unmanageable, 22nd. Milwaukee, 6th, relays melted in telegraph office. Cape Henry, Va., 28th, wires badly affected, cut out instruments. Portland, Me., 13th, heavy thunder-storm, communication seriously affected. Mt. Washington, 23rd, switch cut-out had to be drawn, wire burnt dark blue; 27th, wires so seriously interfered with, that the switch cut-out had to be withdrawn.

OPTICAL PHENOMENA.

Solar Halos.—1st, Ohio, Tenn., Mich., Ky. 2d, Ill., Ind., Miss., Ohio, Kan., Ky., Tenn. 3d, N. Y., Ohio, Pa., Md., Me., Dak. 4th, Neb., Ohio, Conn. 5th, Mo., N. H., N. Y., Ind., Tenn., R. I., Conn. 6th, Ill., Md., Ohio, Pa., La., Wis. 7th, Conn., Ind., N. Y., Pa., Md., Ala., La., Ohio, Ky., R. I. 8th, Me., R. I. 9th, Ill., Iowa, Mich., Wis., N. Y., Ohio. 10th, Ohio, Michigan, Cal., Fla. 11th, Ala., Wis., Ohio, N. C., Vt. 12th, Ind., N. H., Ky., Vt., Me., Cal. 13th, Conn. 14th, Ohio, N. C. 15th, Tex. 16th, Conn., Mass., Nebr., N. H., N. J., N. Y., Md., R. I., Tex. 17th, Conn., Neb., N. H., N. Y., N. C., Va., Md., Ohio, S. C., R. I. 18th, N. H., N. Y., Me. 19th, Va. 20th, Ill., Ind., Miss., N. Y., Md., Ohio. 21st, Me., Mass., N. H., N. Y., Va., Md., Conn., R. I., Vt., Nebr. 22nd, Me. 24th, Va. 25th, Ill., La., Dak., Ohio. 26th, Miss. 27th, Me., N. H., Ohio, Or. 29th, Ala. 30th, Ohio.

Lunar Halos.—3rd, N. J., Va., Tex. 4th, Dak. 5th, Ind., Mo., Va., Tex. 6th, N. J., Pa., Va., Ind., N. C., Conn., Mont. 7th, Mass., N. J., N. C., Mo., Minn., Ga., Va., R. I., Tex. 8th, Miss., N. C., Va., Nev., Fla., Tex. 9th, Ill., N. J., N. Y., Tex., Iowa, Ga., S. C., Conn., Minn., Idaho. 10th, Iowa, Va., Kan., Minn. 11th, Mass., N. J., Ohio, La., N. J., Cal., Fla. 12th, N. C., N. J., Ky., S. C., Tex. 13th, Ind., Ohio, Va., N. J., N. C., Me., Fla. 14th, Mo., Va. 15th, Ind., Mo., Tex., Cal. 16th, Md. 17th, Tex. 19th, Ind. 20th, Ga. 21st, Va.

Mirage.—Pike's Peak, Col., 9th, 24th; New London, Conn., 11th, 13th; New Bedford, Mass., 15th.

MISCELLANEOUS PHENOMENA.

BOTANICAL.—*New Hampshire*—Contoocookville, in bloom, 21st, red clover. *Vermont*—West Charlotte, in bloom, 9th, red clover, 17th, white clover; ripe, 11th, field strawberries. *Massachusetts*—Somerset, in bloom, 3rd, locust; 4th, white fringe and mountain laurel. Waltham, in bloom, 3rd, sheepberry; 7th, high bush blackberry; 14th, sheep laurel; 16th, poisonfly; 18th, arrowwood; 29th, winterberry and alder; 30th, meadow sweet. *Connecticut*—New London, in bloom, 6th, roses. Southington, in bloom, 3rd, syringia. *New York*—Ardenia, 30th, rye nearly ripe, oats in full head, potatoes looking fair; season very early, crops maturing rapidly; Palermo, in bloom, 3rd, white daisies and clover, 8th, wheat, 12th, locust, 16th, yarrow, 28th, sweet alder; ripe, 10th, strawberries, 25th, red raspberries. Waterburg, ripe, 5th, strawberries; heading, 1st, wheat, 16th, barley; 16th, hessian fly damaging wheat. Starkey, 24th, oats heading. Vernon Centre, 15th, ripe strawberries and potatoes; 25th, haying commenced; 30th, apples promise a full crop, pears and plums somewhat blighted, other fruits in fair condition; hessian fly and weevil injuring wheat. Wappingers Falls, in bloom, 1st, blackberry, 3rd, alder, 7th, moss rose, june pinks, 14th, snapdragon, 19th, potatoes; ripe, 1st, cherries, 16th, red and black currants, 20th, raspberries; 1st, wheat heading, injured by hessian fly; 7th, green peas, for table use; 10th, corn looks yellow and very small; 14th, hessian fly injuring rye; 22nd, oats heading. *New Jersey*—Vineland, 30th, grass, wheat and rye in good condition; sweet potatoes and corn not as good as usual; peaches and apples fair; grapes injured by grape-rot; berries excellent. Freehold, 30th, hay crop very heavy and matured. *Virginia*—near Keswick, harvesting, 7th, wheat, 20th, oats; corn on good land 3 to 5 feet high; hay, good and harvesting; ripe, 25th, tomatoes. Wytheville, ripe, 18th, wheat and currants. *North Carolina*—Fayetteville, ripe, 1st, plums and blackberries, 16th, tomatoes, 28th, peaches; 20th, green corn for table use. Bladen Co., in bloom 26th, cotton. *Florida*—Milton, ripe, 1st, watermelons, peaches, apples, pears, blackberries and huckleberries; 21st, second crop of bush beans. Daytona, ripe, 30th, figs, large crop. *Mississippi*—near Brookhaven, in bloom, 15th, cotton; 9th, corn in silk. *Texas*—near Melissa, 30th, corn prospect good, cotton backward by reason of cool, wet weather; grass very fine. *Tennessee*—near Cleveland, 14th grapes and early peaches rotting. 8th, wheat badly damaged by rust. *Ohio*—Ringgold, wheat best for thirty years, corn fair, oats very good, and tobacco three weeks early, hay crop and fruits of all kinds extra. Milford Valley, 29th, wheat all harvested. Lancaster Co., 29th, harvesting wheat, yield extremely large. Middletown and Circleville, 29th, wheat nearly all harvested, crop very fine. Jacksonburg, ripe, 10th, cherries, 24th, early rose potatoes, gooseberries and red currants; harvesting, 5th, barley, 24th, wheat, 15th, red clover; 6th, green peas for table use. *Indiana*—Vevay, 8th, vegetation and fruits suffering from injurious insects; 18th, wheat harvested; 24th; yield far above the average; in bloom, 18th, chesnut. Rising Sun, 29th, wheat harvested, excellent crop. *Illinois*—Noble, 28th, wheat harvest completed, quality excellent, yield good. *Missouri*—Corning, 20th, corn in silk. Lebanon, 3rd, wheat harvest commenced; ripe, 16th, blackberries, 19th, peaches. Springfield, 4th, corn in silk; ripe, 11th, peaches; 30th, harvesting finished. Oregon, in bloom, 11th, may-weed; 13th, dogwood; 20th, catnip; ripe, 1st, raspberries, 10th, early apples, 12th, cottonwood-seeds, 22nd, peaches.

26th, blackberries; 1st, spring-wheat heading; 12th, wheat harvesting; 20th, early corn for table use. *Michigan*—Litchfield, 30th, spring crops looking fair, but rather backward; insects injuring wheat and potatoes. *Wisconsin*—Embarrass, 2nd, plums and apples a total failure; in bloom, 5th, white clover; 30th, grass, wheat and oats in extra condition, corn only fair. *Wautoma*, 15th, green peas; 28th, new potatoes; 30th rye, oats and wheat looking very well, corn poor. *Iowa*—Guttenburg, 30th, wheat injured by rust, chintz bug doing some damage; corn looking quite favorable, but not as forward as last year; ground is too wet for working; oats moderately good; potatoes fair; grass in fine condition. *Minnesota*—Corn backward on account of cold and wet; potatoes suffer slightly from Colorado bug. *Dakota*—Pembina, ripe, 25th, field strawberries. Olivet, in bloom, 10th, wild roses; ripe, 13th strawberries; heading, 2nd, wild oats, 12th, barley, 20th, spring wheat. *Colorado*—Summit, 14th, turnips and radishes up. *California*—Visalia, ripe, 5th, apricots, 13th, peaches, 18th, blackberries, 22nd, apples; 4th, harvesting grain. Los Angeles, 22nd, hay crop unusually large.

BIRDS.—*Swallows*: Monticello, Ia., 9th. *Cuckoo*: Monticello, Ia., 4th. *Humming bird*: Baxter Springs, Kan., 2nd. *Eagles*: Wappinger's Falls, N. Y., 2nd. *Cut birds*: Wappinger's Falls, N. Y., 7th. *Whippoorwills*: Wappinger's Falls, N. Y., 2nd. *Red birds*: Wappinger's Falls, N. Y., 2nd. *Pigeons*: Palermo, N. Y., 1st. *Bobolinks*: Wappinger's Falls, N. Y., 2nd.

MISCELLANEOUS.—*Butter-flies*: Summit, Col., 28th; Pike's Peak, 13th, 24th. *Tree toads*: Wappinger's Falls, N. Y., 2nd. *Fire-flies*: Afton, Ia., 24th; Monticello, Ia., 12th; Somerset, Mass., 16th; Fall River, Mass., 24th; Palermo, N. Y., 2nd; Freehold, N. J., 3rd; Newark, N. J., 20th; Vernon Centre, N. Y., 20th; Wappinger's Falls, N. Y., 13th; West Charlotte, Vt., 22nd; Woodstock, Vt., 9th; Wytheville, Va., 3rd; Embarrass, Wis., 2nd. *Bees*: Summit, Col., 25th; Vernon Centre, N. Y., 3rd, swarming. *Frogs piping*: Pembina, Dak., 25th. *Mosquitos*: Tybee Island, Ga., 30th; Van West, Ohio, 29th. *Seventeen-year Locusts*: Afton, Iowa, 19th; Des Moines, Iowa, 3d, hatching by millions, all bearing the letter "W" on their wings. *Crickets*: Somerset, Mass., 2d. *Army Cotton Worm*: Columbus, Tex., 27th. *Grasshoppers*: Clear Creek, Neb., 21st. Salt Lake City,—from the "Salt Lake Herald" the following is reported: "11th, southern train stopped at Sandy by grasshoppers; 20th, numerous on bench lands and many killed by a small worm; 29th, eighteen to twenty grain farms destroyed by grasshoppers at Heber City, Utah." Dodge City, 18th, 11 a. m., from S. to N.; 19th, 2 p. m., S. to N. Pembina, 25th. *Potato Bugs*: Somerset, Mass., 30th, numerous, eggs laid on all kinds of vegetation; Contoocookville, N. H., 3d; Mill Village, N. H., 29th; Wappinger's Falls, N. Y., 19th; Bloominggrove, Pa., 30th; Mount Washington, N. H., on summit, 15th, 21st; Wautoma, Wis., 28th.

Meteors.—Vevay, Ind., 26th, 30th; near Arlington, Ind., 1st; Monticello, Iowa, 2nd; Independence, Iowa, 27th; near Woodstock, Md., 5th, 13th, 19th, 22nd; Springfield, Mass., 13th; Rowe, Mass., 18th; near Fayette, Miss., 20th; Emerson, Neb., 29th; Clear Creek, Neb., 28th; Waterburg, N. Y., 2nd; Wappinger's Falls, N. Y., 28th, 29th; South Hartford, N. Y., 4th; Vernon Centre, N. Y., 13th; Westerville, Ohio, 28th; near Melissa, Tex., 20th; Wytheville, Va., 20th, 22nd; Colorado Springs, Col., 23rd. Detroit, 1st, 2.50 a. m., brilliant meteor from N. E. to S., alt. 60°, color mostly blue, leaving train lasting two to three minutes, but no cloud. Savannah, Ga., 12th, 7:15 p. m., brilliant meteor from E. to W., leaving train lasting twenty minutes. Dubuque, Iowa, 28th, 2 a. m., brilliant meteor from S. to N., exploded about 30° from N. horizon, color bright orange or red, about $\frac{1}{2}$ mile high, making vicinity light as day. Indianola, 16th, from N. W., altitude 45° to 60°, motion, S. W., and downward; at altitude 20° to 25° in the S. W., it exploded, fragments of bluish color; duration, 5 to 10 seconds; no cloud.

Polar Bands.—New Corydon, Ind., 1st, 4th, 11th; Muscatine, Ia., 10th; Iowa City, Ia., 5th, 6th, 16th, 17th, 23rd, 28th; Tabor, Ia., 27th; Auburn, N. H., 4th, 7th, 22nd; Freehold, N. J., 21st; Wytheville, Va., 5th, 6th, 12th to 14th; Woodstock, Vt., 26th.

Zodiacal Light.—Daytona, Fla., 1st, 2nd, 17th, 21st to 28th; Clear Creek, Neb., 3rd.

Earthquakes.—April 23rd, at Lareto, on Gulf of California, 10 a. m., severe shock, lasting 2 or 3 seconds, the first of a series lasting until May 3rd, occurring principally at night. May 21st, San Bernardino, Cal., "pretty sharp shock." June 4th, San Jose, Costa Rica, 12:28 p. m., light shock. 9th, San Jose, Costa Rica, 4:34 p. m., very strong shock; Liberia, 4:45 p. m., large and strong shock. At Los Angeles, Cal., four distinct shocks occurred on June 11th and 12th, as follows: 11th, 11:12 p. m., a distinct shock, duration over a second, awakened people from sound sleep; 11:20 p. m., violent shock; duration five seconds, motion from NW. to SE., a slight upheaval was first felt, followed by three shocks of a trembling character, the second of which was the most violent, glassware was broken and plastering shaken down. 12th, 2:30 a. m., light shock; 6:30 a. m., slight tremble. 14th, at Cimarron, N. M., slight shock of short duration, window panes broken.

Sunsets.—The characteristics of the sky, at sunset, as indicative of fair or foul weather for the succeeding twenty-four hours, have been observed at all Signal Service Stations. Reports from 115 stations show 3,427 observations to have been made, of which 57 were reported doubtful. Of the remainder, 2,752, or 81.7 per cent, were followed by the expected weather.

Sun Spots.—The following observations, made by Mr. D. P. Todd, have been forwarded by Rear Admiral John Rodgers, U. S. Navy, Superintendent U. S. Naval Observatory, Washington, D. C., viz:

June, 1878.	No. of new—		Disappeared by solar rotation.		Reappeared by solar rotation.		Total number visible.		Remarks.
	Groups	Spots.	Groups	Spots.	Groups	Spots.	Groups	Spots.	
3rd, 2 p. m...	1	10	0	0	1	10	3	28	Faculæ. Faculæ.
4th, 2 p. m...	0	0	0	0	0	0	3	12	
5th, 1 p. m...	0	0	0	0	0	0	1	5	
7th, 5 p. m...	0	0	1	5	0	0	0	0	
11th, 12 m...	0	0	0	0	0	0	0	0	
12th, 12 m...	0	0	0	0	0	0	0	0	
13th, 12 m...	0	0	0	0	0	0	0	0	
14th, 1 p. m...	0	0	0	0	0	0	0	0	
15th, 12 m...	0	0	0	0	0	0	0	0	
19th, 12 m...	0	0	0	0	0	0	0	0	
20th, 12 m...	0	0	0	0	0	0	0	0	Faculæ.
24th, 12 m...	1	2	0	0	1	2	1	2	
25th, 12 m...	0	0	0	0	0	0	0	0	
26th, 12 m...	1	8	0	0	0	0	1	8	
27th, 5 p. m...	0	0	0	0	0	0	1	8	

Prof. G. Hinrichs, Iowa City, Ia., reports: none observed on the 5th, 6th, 10th, 11th, 17th, 18th, 19th, 22nd, 23rd; 1st, 2 groups and four spots, two rather largespots; 3rd, 2 groups, three spots, very much smaller; 4th, one group, two spots, quite small; 26th, one group, two spots, both spots large; 27th, one group, three spots. The Signal Service observer at Portsmouth, N. C., reports none observed on the 16th; 3 groups on the 3rd.

PUBLISHED BY ORDER OF THE SECRETARY OF WAR.

Albert J. Myer

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